



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005MN102B

Title: Estrogens and Estrogenic Activity in Swine Manure

Project Type: Research

Focus Categories: Toxic Substances, Agriculture

Keywords: Endocrine disrupters, hormones, swine manure

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Abstract

Estrogen hormones are one of many emerging contaminant that are attracting public attention because at low concentrations these pollutants can adversely affect the reproductive biology of vertebrate species such as fish, turtle, frogs, wild animals, and humans. One source of these contaminants to water bodies is from runoff from manure-applied fields. The potential impact of these chemicals present in manure on the quality of surface and ground waters, and aquatic ecosystems remains to be elucidated. However, as a start there is lack of research data on the scope of estrogen levels, especially conjugated estrogens and their estrogenic activity in various types of manure.

Minnesota ranks third in hog production in the United States with 6.4 million pigs. This is equivalent to 9.1 million tons of manure production annually. The goal of this research is to quantify the levels of various forms of estrogens and their activity in various types of

swine waste facilities in Minnesota. This would provide a baseline data base on the extent of estrogen levels in swine manure and how these levels and the estrogenic activity varies with age of pigs, different production style (farrow-to-feeder; Feeder-to-finish; and farrow-to-finish), different waste management plans (open lagoons vs covered lagoons, aerobic vs anaerobic lagoons) and seasons (spring, summer, and fall/winter).

To be successful in protecting the water quality in Minnesota lakes, rivers, and aquifers, risk identification and assessment need to precede mitigation plans. Thus, this project will provide the baseline data for estrogens levels and estrogenic activity in various swine facilities in Minnesota. This research is relevant to the concern of public health and ecological impact. The data generated in this study will be useful to state and federal agencies for environmental risk assessment.